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US 5247440 A

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(54) Integrated vehicle control system

(57) In a system to control various systems on a vehicle eg the ventillation system 160, the position of the vehicle is determined 110 and the positions of the vehicle at which system parameters are changed are memorised 150. The systems are then operated according to the memorised settings when the vehicle returns to the memorised positions on subsequent journeys.

In this way the vehicle driver can be automatically protected from pollution by adjusting the ventillation system when the vehicle enters a town or tunnel.

The position determination system may comprise a GPS system.

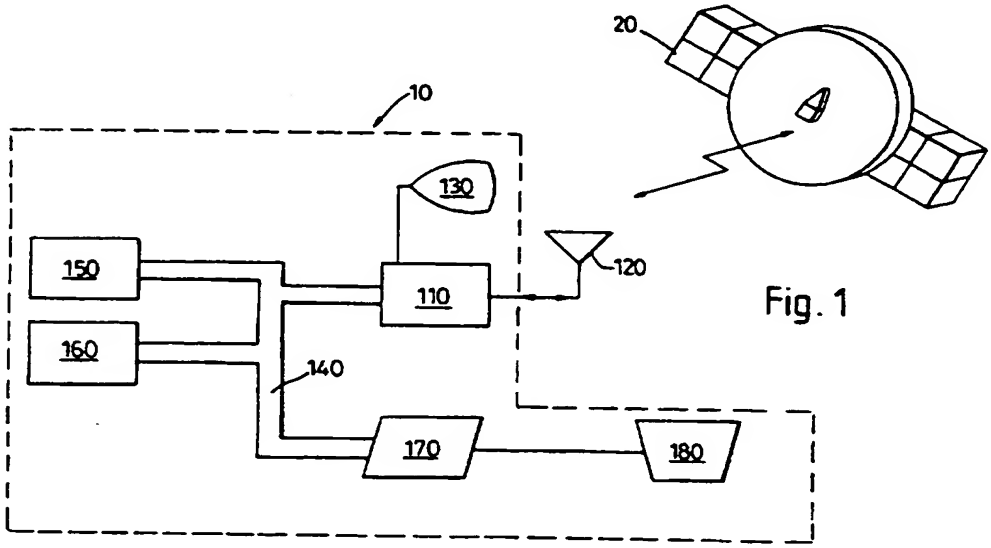

Fig. 1

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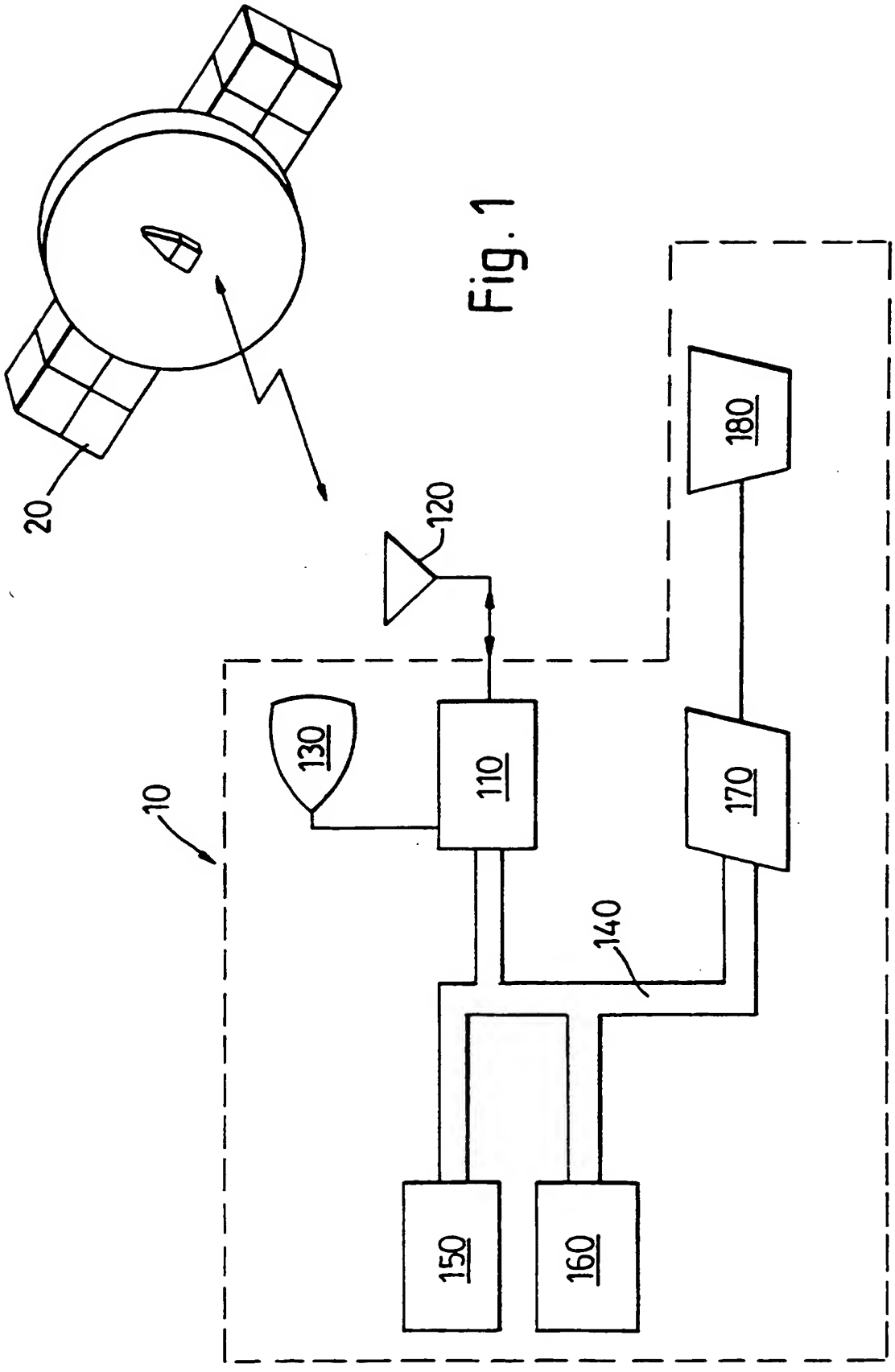

Fig. 1

An Integrated Motor Vehicle Control System

This invention relates to motor vehicle control systems and in particular to the integration of navigation systems into such systems.

It is known to provide a vehicle with a system for determining its position. One version of such a system is a navigation system which determines the vehicle position by communicating with a geopositional satellite, such as the "Navistar Global Positioning System", and obtaining co-ordinates therefrom. Another version determines the vehicle position by monitoring transmissions from transponders on or near the roadside, which may be mounted for example within lampposts, on overhead gantries or at toll booths. In both these cases, a receiver is mounted in the vehicle. The systems described above use the co-ordinates received to present information to the driver such as navigational information or details about the collection of tolls.

It is also known from EP 0 242 099 to provide a vehicle with a control system in which vehicle systems communicate with each other and pass instructions and information between those systems using a common data bus.

It is an object of the present invention to provide a motor vehicle navigation system which is integrated into

the vehicle control system and has an effect on at least one other vehicle system.

According to the invention there is provided a control system for controlling a function of a vehicle system forming part of a vehicle, the control system comprising position determining means and control means arranged to control said function in response to a signal from the position determining means wherein the control means is arranged to memorise vehicle positions at which system settings are changed during a journey and repeat said changes at substantially the same position during a subsequent journey.

Said changes may be memorised as a result of being made on a plurality of occasions when said vehicle is in said position.

The vehicle user is preferably able to programme the control means to memorise said changes and the vehicle position at which they are made, and more preferably also to memorise the direction of travel of the vehicle.

The vehicle position determining means may comprise a navigation system.

Said vehicle system may comprise a climatic control system.

The invention will now be described by way of example only with reference to the accompanying drawing in which:

Figure 1 is a schematic diagram of a preferred embodiment of the present invention.

With reference to Figure 1, a control system is provided which comprises a position determining means in the form of a navigation system 110 mounted on a vehicle 10 arranged to receive signals through a satellite receiver 120 also mounted on the vehicle 10 from a geopositional satellite (GPS) 20 orbiting the earth. The position determining means further comprises a display means 130 which is in communication with the navigation system 110. The navigation system 110 is integrated with the multiplexed vehicle systems by communicating on a common data bus 140. Further systems in communication via the data bus 140 are a body control module BCM 150, a climatic control system 160 and an interface 170 to allow the driver to communicate with the vehicle systems on the data bus 140 from a driver control panel 180.

The navigation system 110 is active all the time and periodically requests its position from the GPS 20, for example every 2 minutes. The co-ordinates are decoded and navigational information is presented to the driver on the display 130.

The navigational information derived from the navigation system 110 is made available on the data bus 140. That information is collected by the BCM 150 which customises the navigational information into a form suitable for use by relevant systems elsewhere in the vehicle 10. This customised information is then placed on the data bus 140 and collected by the systems arranged to receive it.

In this embodiment, one system which is arranged to make changes as a result of processed signals from the BCM 150 is the climatic control system 160.

When the user implements changes to the settings of the climatic control system 160, information defining those changes is placed on the data bus 140 by the climatic control system 160 and the interface 170 and that information is collected by the BCM 150. If those changes are repeatedly made at substantially the same position, the BCM 150 is arranged to learn and memorise the settings using positional information derived from the navigation system 110. The BCM 150 will automatically reset the climatic control system 160 to the appropriate setting for the vehicle's position from memory whenever it detects, from the navigation system 110, that the vehicle 10 is entering an area where certain settings are habitually selected.

A programming button (not shown separately) is provided on the driver control panel 180 and is used to select a memorising mode by which the BCM 150 is set to memorise the settings input manually. In this mode, every time the driver changes the settings of the climatic control system 160 manually, the BCM 150 stores in memory the change which was made and the position and direction of travel of the vehicle 10, obtained from the navigation system 110, when the change was made. Subsequently, whenever the BCM 150 determines, from information sent to it by the navigation system 110, that the position and direction of travel of the vehicle are the same as when one of the settings was made, the BCM 150 automatically makes the same change to the settings, without any manual input from the driver. These settings are stored and recalled by the BCM 150 each time the vehicle 10 repeats the appropriate journey or section thereof. As with the automatic learning mode described above, the repetition of settings is implemented by the BCM 150 in co-operation with the navigation system 110.

Using the above disclosed techniques, the climatic control system 160 is arranged to learn the driver's wishes in relation to geographical position and automatically implement those choices of setting on subsequent journeys, both automatically or by manual selection.

The climatic control system 160 is further instructed to select recirculation when the navigation system 110

determines that the vehicle 10 has entered an area of known high pollution. This feature can cover predefined areas such as on stretches of uphill road used by heavy lorries making a lot of smoke or on entering a tunnel. Local instructions are used to enable this feature and are passed to the BCM 150 through the navigation system 110 or through the integration of a car radio receiver or mobile telephone (neither shown) onto the data bus 140.

It will be appreciated that the navigation system 110 can receive co-ordinates from one or more GPS 20. Also, the positional condition determining means is not limited to deriving the vehicle position solely from a GPS. Other positioning systems, such as roadside transponders, could equally well be used.

CLAIMS

1. A control system for controlling a function of a vehicle system forming part of a vehicle, the control system comprising position determining means and control means arranged to control said function in response to a signal from the position determining means wherein the control means is arranged to memorise vehicle positions at which system settings are changed during a journey and repeat said changes at substantially the same position during a subsequent journey.

2. A control system according to claim 1 wherein the control means is also arranged to memorise the direction of travel of the vehicle when said settings are changed.

3. A control system according to claim 1 wherein said changes are memorised as a result of being made on each of a plurality of occasions when said vehicle is in said position.

4. A control system according to claim 2 wherein said changes are memorised as a result of being made on each of a plurality of occasions when said vehicle is in said position and travelling in said direction.

5. A control system according to any foregoing claim wherein the vehicle user can programme the control

means to memorise said changes and the vehicle position at which they are made.

6. A control system according to claim 5 when dependant on claim 2 wherein the vehicle user can programme the control means to memorise the direction of travel of the vehicle when the changes are made.

7. A control system according to any preceding claim wherein the vehicle position determining means comprises a navigation system.

8. A control system according to any preceding claim wherein said vehicle system comprises a climatic control system.

9. A control system substantially as described herein with reference to the accompanying drawing.

The Patent Office

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Application No: GB 9617144.2
Claims searched: 1-9

Examiner: Mr Andrew Bartlett
Date of search: 9 October 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): G3N (NGA3, NGA4, NGBC1,NGE1A, NGE1B, NGE1, NGE2); H4D (DAB);

Int Cl (Ed.6): G01S 5/14; G01C 21/00 & 04; G05B 19/42; B60H 1/00

Other: ONLINE:- WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage			Relevant to claims
A	US 5247440	(Capurka et al)	See col 1 lines 45-51	1 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.